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Translation of

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INSERTION PART FOR INSERTING INTO A GAS OR LIQUID LINE

The invention relates to an insertion part having a housing, which can be inserted into a gas or liquid line, with an annular lip shaped part being arranged in the interior of the housing, held to the interior of the housing with its annular body, which is provided in an area of a feeder channel and has at least one lip, that can be displaced by the fluid, and cooperates with an opposing housing wall.

A back-flow valve is known from DE 1 154 982, which is provided with a housing that can be inserted into a gas or liquid line, with a sealing body being movably arranged inside the housing, which seals the flow opening of a feeder channel in the closed position. The sealing body of the known back-flow valve is embodied as an essentially hose-shaped lip shaped part, extending in the annular direction, which is held inside the housing and contacts with its cylindrical housing part, surrounded by the sealing body, the lip end region in a sealing manner in the area of the flow opening of the feeder channel.

The sanitary insertion part known from DE 1 154 982 is embodied as a back-flow valve, with its sealing body being adjusted either to an open or a closed position. The insertion part known from 1 154 982 however is not embodied as a flow regulator, which can adjust the volume of the flow passing through the water line per time unit depending on a maximum value independent from the pressure.

From GB-PS 875 034 another mere back-flow valve is known, which encompasses in its housing a cylindrical interior housing space. In this interior housing space a piston-like valve unit is guided in a shiftable manner, which can be displaced under the pressure of the water flowing from the inlet to the opposite face of the interior housing space provided. This piston-like valve unit is provided with a lip shaped piece, which seals in

its resting position the flow openings which penetrate the valve unit and which can be moved into an open position by water flowing in the flow direction. When an amount of water flows opposite the flow direction, the lip end region of the lip shaped piece is pressed against the wall edge region encompassing the flow openings and effectively counteracts the back-flow of the water. Here, too, the insertion part known from GB-PS 875 034 is neither intended nor suitable as a flow regulator.

From DE 1 182 487 a back-flow valve is known intended for high operational pressure, in which the annular channel between the valve housing and a centered insertion body, inserted therein in a streamline shape, is sealed by a sheath-shaped valve piece made from an elastic material. While the sealing piece is motioned by the water flowing in the usual flow direction, an amount of water reversing opposite the usual flow direction presses the sealing piece increasingly against the streamlined insertion body so that the annular channel remains sealed.

Comparable back-flow valves have also been known from FR 2 426 199, US-PS 2 621 889, DE 109 871, FR 1 389 947, DE 938 888, DE 946 760, DE 1 500 206 as well as from DE 37 06 737.

As already mentioned, none of these known back-flow valves are capable of adjusting the volume to a maximum value that can flow through the water line per time unit independent from the pressure.

Flow regulators have already been designed, which are provided with a tapering or cone-shaped housing core on the inside of their housing. The housing core is encompassed by an annular throttle body or control body made from an elastic material, which limits the control gap between itself and the housing core depending on the pressure. When producing the previously known flow regulators, the necessary throttle bodies and control bodies are subject to the elastic characteristics of the rubber material, which can lead to different control features of one insertion part to another. Furthermore, the known

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insertion parts are usually embodied in multiple parts and are thus expensive in their production.

Therefore, the object is to provide a multi-use insertion part, which is characterized in a simple production and preferably also in a consistent and secure function.

The solution according to the invention comprises an insertion part of the type mentioned at the outset in particular in that the insertion part is embodied as a flow regulator, with its lip shaped part having at least one throttle body or one control body and being provided with a control lip, its free lip end that extends in a direction of the adjacent housing wall, which control lip limits the control gap and changes depending on pressure, between itself and the adjacent housing wall.

The insertion part according to the invention is embodied as a flow regulator. The insertion part, which can be inserted into a gas line or a liquid line as a flow regulator, is provided with a lip shaped part, which is held inside the housing. This lip shaped part has at least one control lip, embodied as a throttle body or a control body and aligned with its free lip end extending in the direction of the adjacent housing wall. This control lip can be displaced depending on the pressure of the fluid such that the control gap provided between the control lip and the adjacent housing wall is modified depending on the pressure. Due to the fact that the insertion part, which can easily be produced essentially in two parts, is also provided with a control lip and due to the fact that the reaction behavior of this control body is less dependent on the elastic features of the material composition used but rather from the shape and the dimensions of the control lip, the insertion part according to the invention is characterized in a constant control function.

Here, a particularly beneficial further development of the invention provides that the insertion part is simultaneously embodied as a back-flow preventer and that the annular lip shaped part of the insertion part has at least one sealing lip, which is provided as a sealing body, movably arranged inside the housing, and sealing in the closed position the

flow opening of the feeder channel, with the sealing lip in the closed position contacting the opposing housing surface in a sealing fashion.

The insertion part, simultaneously embodied as a back-flow preventer, is provided with an annular lip shaped part which is held with its annular body inside the housing. This lip shaped part has at least one sealing lip that can be displaced by the fluid, and can be moved by a back-flow of the fluid in a direction of an opposite housing surface such that the sealing lip in its closed position contacts with its lip end region a housing surface in a sealing manner. When the housing is embodied in one part, the insertion part according to the invention can be embodied essentially in two parts, namely the housing and the lip shaped part. This small number of parts is beneficial for the high functional security of the insertion part according to the invention.

Here, a preferred embodiment of the invention includes for the inside of the housing to be provided with a housing core, which limits a flow opening between itself and the interior circumference of the housing, and the lip shaped part is held with its annular body at the interior circumference of the housing and contacts the housing core with its free lip end region of its sealing lip in a sealing manner in the closed position.

It is particularly advantageous for the lip shaped part to be held with its annular body at the interior circumference of the housing, in order to align the free lip end of the control lip in a direction toward the adjacent housing wall of a housing core.

A further development according to the invention, worth protecting in itself, combines the function of a flow regulator and a back-flow preventer in a single insertion part and provides for the lip shaped part to have at least one upstream control lip and/or control lip and at least one downstream sealing lip.

In order to achieve a sensitive reaction behavior, largely independent from the material of the flow regulator according to the invention, it is beneficial for the control lip to be aligned with its free lip end region extending in the direction opposite to the flow

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direction of the fluid and limiting an annular space open in the upstream direction between itself and the interior circumference of the housing. In this blind-hole shaped, upstream opening annular space, the inflowing fluid impinges the control lip such that the lip is pressed towards the housing core depending on pressure and thus changes the control gap limiting and leveling the amount flowing.

In order to allow the targeted amount of fluid to flow unhindered through the insertion part during low as well as high pressures, it is beneficial for the housing wall adjacent to the free lip end of the control lip to be provided with a control profiling, with the control profiling preferably being formed by grooves or moldings aligned in the direction of the flow. These moldings may also be provided at the housing core in the area of the control lip, for example. Due to the fact that the control lip is not pressed in a direction of the adjacent housing wall until a defined pressure value has been reached, the control lip reacts with a distinctly noticeable peak at this pressure value, which can be utilized as a control impulse for subsequent devices downstream.

[continue: pages 5 and on of the original description]

[This corresponds to page 4, line 11 of the Translated Application]